BREVIORA

Museum of Comparative Zoology

CAMBRIDGE, MASS. FEBRUARY 1, 1963 NUMBER 181

SYSTEMATIC NOTES ON THE LAND SNAILS OF THE GENUS TOMOCYCLUS (CYCLOPHORIDAE)

By FRED G. THOMPSON

Department of Zoology
University of Miami

The genus *Tomocyclus* includes neotropical cyclophorid snails with a chondroid operculum, bearing a spiral lamella, an elongate-turrite shell and a double peristome. The outer peristome flares to produce a broad collar around the aperture. The parietal region of the outer peristome is bent anteriorly to pass under the preceding whorl. At this point a notch, the pseudosiphon, occurs in the reflected outer peristome.

Present knowledge of the anatomy of *Tomocyclus* is based on the account of Fischer and Crosse (1886). The verge is long, simple, tapering and unbranched. It originates on the right side of the neck, behind the tentacle, and possesses an open seminal groove. The jaw is typically cyclophorid, with a median projection. The radular formula is 3-3-3-3. Morrison (1955: 152) classified the American cyclophorid snails, and placed *Tomocyclus* in the subfamily Neopupinae, an allocation complying with most previous systems of classification. Torre and Bartsch (1942: 3) proposed the name Megalomastominae for this same subfamily, because the name Neopupinae was proposed five years prior to its assumed type genus, *Neopupina* (Kobelt, 1902: 261), and because they recognized *Neopupina* as a subgenus of *Megalomastoma*. Whether *Neopupina* is or is not distinct from *Megalomastoma*, the name Megalomastominae should be retained for this subfamily.

The genus *Tomocyclus* is known from British Honduras, eastern Guatemala, and in Mexico from Chiapas and the isolated mountain region of San Andres Tuxtla, Vera Cruz.

MEASUREMENTS

For purposes of this study, measurements of height were made to include only the last four remaining whorls. Mature specimens of *Tomocyclus* are generally decollate, and shells in a single lot may have 4-8 whorls remaining. Therefore, measurements must be made from a point that is consistently present, and represents the same relative growth.

Measurements of length and diameter were made with vernier calipers, and are standard except for the special condition mentioned above. Measurements of the aperture and outer peristome were made with a calibrated Whipple disc. The diameter of the aperture was measured from the outside of the extended inner peristome. The width of the outer peristome (the collar) was measured at four places, and the readings were averaged.

ACKNOWLEDGEMENTS

I wish to express my gratitude to the following people for lending specimens in their charge and for other courtesies that have facilitated this study: Dr. Tucker Abbott, Academy of Natural Sciences of Philadelphia (ANSP); Dr. William J. Clench, Museum of Comparative Zoology, Harvard University (MCZ); Dr. Harold A. Rehder, United States National Museum (USNM); and Dr. Henry van der Schalie, Museum of Zoology, University of Michigan (UMMZ). The photographs for Plate 1 were taken by William L. Bruden, staff artist of the Museum of Zoology, University of Michigan.

Key to the Species of TOMOCYCLUS

1. Basal carina present 2
1a. Basal carina absent 4
2. Axial sculpture consisting of well developed riblets *gealei*
2a. Axial sculpture consisting of fine striations 3
3. Basal carina passing in front of reflected outer peristome; diameter of aperture 7.45-9.50 mm. *fistulosus*
3a. Basal carina passing beneath or behind reflected outer peristome; diameter of aperture 5.73-7.13 mm. *simulacrum*
4. Width-height ratio about 0.4 . . *guatemalensis*
4a. Width-height ratio about 0.5 . . *lunae*

TOMOCYCLUS GEALEI Crosse and Fischer

Tomocyclus gealei Crosse and Fischer, 1872, Jour. Conchyl., 20: 70; Fischer and Crosse, 1886, Miss. Sci. Mex. Amer. Cent., 2 (7): 118-120, pl. 40,

figs. 1-3; Bartsch and Morrison, 1942, Bull. U. S. Nat. Mus., 181: 143-144, pl. 19, fig. 1.

Megalomastoma (*Tomocyclus*) *gealei* (Crosse and Fischer), von Martens, 1890, Biol. Cent. Amer., 9: 10.

Type locality: State of Chiapas, Mexico.

Records: GUATEMALA: *Alta Vera Paz:* woods between Tactic and Tamahu; Polochic Valley above Panzos and Senahu (von Martens, 1890: 10).

Tomocyclus fistulosus, new species
(Pl. 1, figs. 1-3)

Description: Shell dull yellow, with early whorls and last quarter of last whorl becoming cinnamon, or rosy; translucent, large, elongate-turrite; decollate, $5\frac{1}{4}$ whorls remaining in the holotype; whorls gradually increasing in size, fourth from last whorl about 0.6 times diameter of last whorl, rate of increase in diameter of whorls nearly constant; spire slightly convex, nearly straight sided; whorls convex, suture moderately impressed; whorls crossed by fine, poorly developed, posteriorly arched growth wrinkles, which lie about 0.5 mm. apart; wrinkles faintly discernible, distinctness and spacing of wrinkles steadily increasing on last whorl; wrinkles continuing onto reflected outer peristome; whorls also with numerous fine spiral striations, which are frequently broken along their courses; base of last whorl with a strong carina, which passes in front of the aperture (Pl. 1, fig. 3); carina originating on last half of penultimate whorl, and continuing nearly to reflected peristome; last half of last whorl lying just inside of crest of carina; peristome double; outer peristome dull white, forming a slight irregular collar, 0.97-2.06 mm. wide, 0.1-0.24 times the diameter of the aperture; face of collar with several annulations, which are crossed by numerous close, fine, irregular, granular ridges that occasionally anastomose; parietal region of collar indented by a nearly rectangular pseudosiphon notch, about 1 mm. deep and 2 mm. wide; aperture dull white, circular; columella tubular, continuing spirally through length of shell, open at first remaining whorl and umbilicus as a narrow slit; umbilicus nearly obscured by collar. Operculum dark brown, typically tomocycloid, consisting of a thin inner chondroid plate, and an external spiral lamella; inner surface of chondroid plate bearing a central knob; spiral lamella originating in center of operculum, and reflected to lie parallel to chondroid plate; edge of lamella frequently broken to produce a fringed appearance.

Measurements of holotype: total length, 32.5 mm.; length of last four whorls 30.0 mm.; diameter, 11.2 mm.; major height of aperture, 10.9 mm.; major width of aperture, 11.02 mm.; height of inner peristome, 7.56 mm.; width of inner peristome, 7.78 mm.

Measurements of paratypes:

Length	Diameter	Width of Collar	Inner Peristome
28.5 mm.	10.9 mm.	0.97 mm.	9.50 mm.
29.7	10.8	1.78	7.83
28.6	10.7	1.48	7.45
33.1	11.8	2.06	8.48

Major variations involve only size of the shell and width of the collar, and even these variations are relatively slight.

Holotype: UMMZ 194095, high rainforest at Vallentine Camp, 50 miles southwest of Cayo, British Honduras. Collected by C. L. Lundell and E. B. Mains in 1936 while conducting botanical investigations.

Paratypes: UMMZ 66226 (4 specimens); same data as the holotype.

T. fistulosus appears to be most closely related to *T. simulacrum*. Characters which separate these two species from the other species of the genus are the presence of a basal carina and fine axial sculpture.

T. fistulosus is separated from *T. simulacrum* on the basis of five characters: (1) the diameter of the fourth from the last whorl is about 0.60 times the diameter of the last whorl; (2) the aperture is 7.45-9.50 mm. in diameter; (3) the collar is relatively narrow, 0.10-0.24 times the diameter of the aperture; (4) the pseudosiphon is a rectangular indentation; (5) the basal carina is larger in circumference, passing in front of the reflected outer peristome, and continuing to the last quarter of the last whorl (Pl. I, fig. 3).

T. simulacrum may be recognized by the following characters: (1) the diameter of the fourth from the last whorl is about 0.75 times the diameter of the last whorl; (2) the aperture is 5.73-7.13 mm. in diameter; (3) the relative width of the collar is 0.24-0.38 times the diameter of the aperture; (4) the pseudosiphon is circular, and is open or closed; (5) the basal carina is smaller in circumference, passes beneath or behind the reflected outer peristome, and extends only a little beyond the last half of the last whorl.

Tomocyclus simulacrum (Morelet)

Cyclostoma simulacrum Morelet, 1849, Test. Nov. Insul. Cub. Amer. Cent.: 22 (Type locality: Petén, Guatemala).

Cyclostoma copanense Sowerby, 1850, Thes. Conchyl., 1 (Suppl.): 165, pl. 13B, figs. 310, 311 (Type locality: Coban, Guatemala).

Megalomastoma simulacrum var. *minus* von Martens, 1890, Biol. Cent. Amer., 9: 10.

Megalomastoma simulacrum var. *gracilis* von Martens, 1890, Biol. Cent. Amer., 9: 10 (Type locality: between Tactic and Tamahu, Guatemala).

Tomocyclus siphonis Bartsch and Morrison, 1942, Bull. U. S. Nat. Mus., 181: 145, pl. 19, fig. 5 (Type locality: Alta Vera Paz, Guatemala).

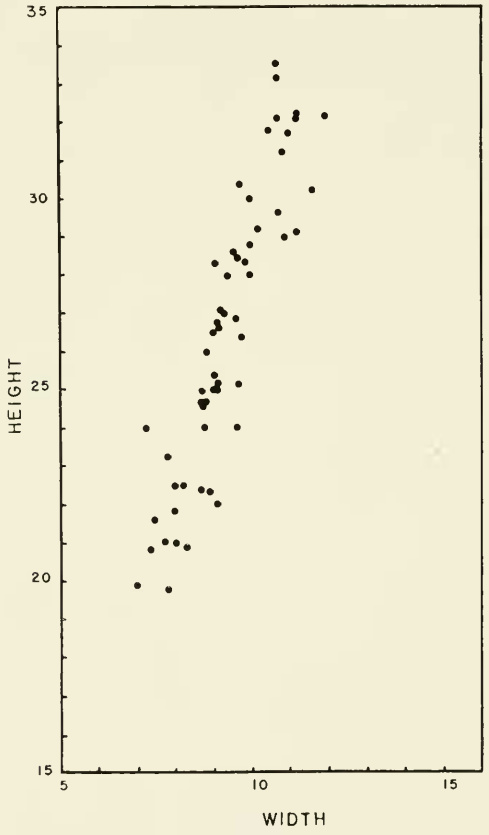
Tomocyclus constrictus Bartsch and Morrison, 1942, Bull. U. S. Nat. Mus., 181: 145-146, pl. 19, fig. 2 (Type locality: Coban, Guatemala).

Shell cinnamon or rosy, early whorls and last half of last whorl dull yellow brown; opaque or only slightly translucent; of moderate or large size (measurements of height and width, and their relationship, are expressed in Text-figure 1); pupiform to elongate-turrite; decollate, 4-8 whorls remaining; spire nearly straight sided or moderately convex (Bartsch and Morrison, 1942: pl. 19, figs. 2, 3, 5, 6); diameter of fourth whorl about 0.75 times the diameter of last whorl; whorls convex, depth of suture variable, usually moderately impressed; whorls crossed by numerous fine posteriorly arched axial striations, which continue onto reflected peristome; raised spiral sculpture only faintly evident at irregular intervals; base of last whorl with a distinct carina which passes below or behind the reflected outer peristome, carina usually evident only on earlier half of last whorl; peristome double; outer peristome usually forming a broad, irregular collar 1.55-2.89 mm. wide, 0.24-0.38 times the diameter of the aperture; face of collar dull white, with a few annulations which are usually distinguishable only near the inner peristome; parietal region of collar with a pseudosiphon which may vary from an open crescent to a round hole connected to the outside by a narrow slit; aperture dull white, circular, 5.73-7.13 mm. wide; columella tubular, spiral, open at first remaining whorl, and at umbilicus as a circular chink.

T. simulacrum is highly variable, as is indicated by its lengthy synonymy. The name proposed by Morelet has been properly applied by subsequent authors. *Cyclostoma copanense* Sowerby was described as being smaller than *simulacrum*. Later authors found that the two forms were not as distinct as Sowerby believed, and Fischer and Crosse (1886: 121), von Martens (1890: 10) and Kobelt (1902: 271) considered *copanense* as a variety

of *simulacrum*. Recently, Bartsch and Morrison (1942: 147-148) reallocated *copanense* to specific status. Specimens under 27 mm. in total length were assigned to *copanense*, and specimens over 35 mm. in total length were assigned to *simulacrum*.

As is demonstrated in the diagram (Text-figure 1) no significant difference in size will distinguish the two forms. Different specimens in various lots are represented near both extremes



Text-figure 1

This diagram demonstrates the relationship between height and width of the shell of *Tomocyclus simulacrum* (Morelet). Measurements of height were made to include the last four remaining whorls. Measurements of width are standard. All measurements are in millimeters.

of the same graph, and the remaining specimens in these same lots are represented at many intermediate loci. Since such variability of size commonly occurs within a single lot, *copanense* cannot be recognized even as a variety of *simulacrum*.

Megalomastoma simulacrum var. *minus* was proposed by von Martens as a synonym of *copanense*. This is clear by his use of the two names. *Megalomastoma simulacrum* var. *gracilis* is also indistinguishable from *simulacrum*, for the slight difference of shape used to separate the two forms is highly variable and lots containing only a few specimens cannot be satisfactorily sorted into two groups by use of this character.

Tomocyclus siphonis Bartsch and Morrison was distinguished from *simulacrum* by the presence of a closed pseudosiphon as opposed to an open one. Comparison of the type of *siphonis* (USNM 162511) with many specimens of *simulacrum* shows that this character varies from a completely enclosed hole connected to the outside by a narrow slit, to a broad open crescent. The distinction between a closed and an open pseudosiphon is obscured by many intermediate stages, thus preventing the differentiation between *siphonis* and *simulacrum*.

Tomocyclus constrictus Bartsch and Morrison was recognized on the basis of a closed pseudosiphon and a relatively deeply impressed suture. As shown above, the nature of the pseudosiphon is an unreliable character. The degree of impression of the suture is also variable. Several lots examined contain specimens that completely bridge the difference from a deep suture with strongly rounded whorls, to a shallow suture with slightly convex whorls. Occasional specimens have a deep suture between the early whorls, and a shallow suture between the later whorls. Thus, *constrictus* cannot be separated from *simulacrum*.

Specimens examined. MEXICO: *no additional data*, UMMZ 87073 (2). GUATEMALA: *no additional data*, ANSP 45643 (3), UMMZ 87075 (1), UMMZ 87076 (1). *Alta Vera Paz:* Chama, ANSP 13105 (1), ANSP 13107 (3), USNM 484861 (1); Coban, MCZ 10061 (6), MCZ ex Bland (4), MCZ ex Robson (2), MCZ ex Bequaert (6), USNM 250693 (4), USNM 516028 (1); Samac, USNM 515763 (2); Finca de Providencia, USNM 32070 (2), USNM 203656 (1), USNM 316385 (3), USNM 321005 (1), USNM 321030 (1), USNM 515764 (1); nr. Arroya Yalchatila, 4 mi. sw of Seiba, UMMZ 64717 (2); 1 km. n of Hacienda Finca Samac, UMMZ 132317 (2); 55 mi. ne Coban, UMMZ 195169 (1); nr. Chinaja, UMMZ 208413 (1). *El Quiche:* 4-6

km. w of Hacienda Finca Pacala. UMMZ 132318 (5). NO DATA: MCZ 4592 (1), MCZ 6791 (4), MCZ 148330 (3), USNM 365365 (1).

Tomocyclus lunae Bartsch

Tomocyclus guatemalensis (in part) Fischer and Crosse, 1886, Miss. Sci. Mex. Amer. Cent., 2: 124, pl. 40, fig. 11a.

Tomocyclus lunae Bartsch, 1945, Proc. Biol. Soc. Wash., 58: 63.

Type locality: Santecomapan, Veracruz, Mexico.

Specimens examined. MEXICO: *Veracruz:* south slope Volcan San Martin, 1040 ft. alt., UMMZ 195170 (1); Volcan San Martin, MCZ (1).

Tomocyclus guatemalensis (Pfeiffer)

Cyclostoma guatemalensis Pfeiffer, 1851, Proc. Zool. Soc. Lond.: 245.

Megalomastoma guatemalensis Pfeiffer, 1852, Monog. Pneumon. Vivent., 1: 132.

Tomocyclus guatemalensis (Pfeiffer). Crosse and Fischer, 1872, Jour. Conchyl., 20: 76; Fischer and Crosse, 1886, Miss. Sci. Mex. Amer. Cent., 2: 124, pl. 40, fig. 11.

Type locality: Vera Paz, Guatemala.

Known only from the type locality.

T. guatemalensis is of doubtful status. I have seen only a single specimen identified as this species (UMMZ 87072, ex Bryant Walker). In most respects this form resembles *T. simulacrum*, but it lacks the basal carina that is present in that species. The distinction between *T. guatemalensis* and *T. lunae* is also uncertain, for the characters used by Bartsch (1945) to separate these two species are subject to variation.

LITERATURE CITED

Bartsch, P.

1945. A new *Tomocyclus* from Mexico. Proc. Biol. Soc. Washington, **58**: 63.

Bartsch, P. and J. P. E. Morrison

1942. The cyclophorid mollusks of the mainland of America. Bull. U. S. Nat. Mus., **181**: 142-291 pls. 19-42.

Fischer, P. and H. Crosse

1886. Mission Scientifique au Mexique et dans l'Amerique Centrale. Mollusca. (7) **2**: 113-126.

Kobelt, W.

1902. Cyclophoridae. Das Tierreich, **16**: i-xxxix, 1-662, figs. 1-110.

Morrison, J. P. E.

1955. Notes on American cyclophorid land snails, with two new names, three new genera, and the family Amphicyclotidae separated on animal characters. Jour. Washington Acad. Sci., **45** (5): 149-162, figs. 1-31.

Torre, C. de la and P. Bartsch

1942. The cyclophorid mollusks of Cuba. Bull. U. S. Nat. Mus., **181**: 3-42, pls. 1-8.

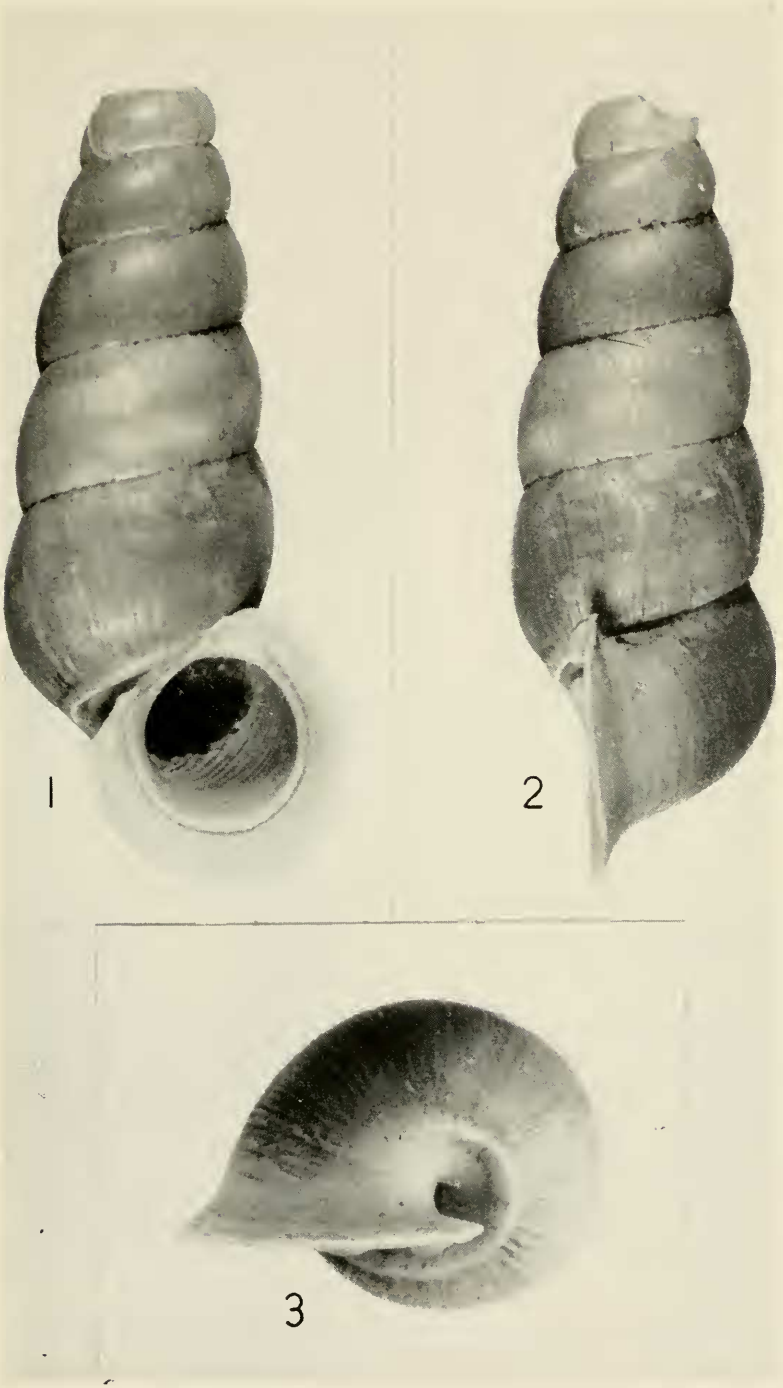
von Martens, E.

1890-1891. Land and freshwater Mollusca. Biol. Cent. Amer., **9**: i-xxvii, 1-706, pls. 1-44.

Plate I

Holotype of *Tomocyclus fistulosus*, new species (UMMZ 194095); high rainforest at Vallentine Camp, 50 miles Southwest of Cayo, British Honduras.

Fig. 1. Frontal view.
Fig. 2. Lateral view.
Fig. 3. Basal view.


1
2
3